Title

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Journal

American Journal of Preventive Medicine, 65(6)

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Publication Date

2023-12-01

DOI

10.1016/j.amepre.2023.07.001

Peer reviewed

HHS Public Access

Author manuscript

Am J Prev Med. Author manuscript; available in PMC 2024 March 08.

Published in final edited form as:

Am J Prev Med. 2023 December ; 65(6): 1015–1025. doi:10.1016/j.amepre.2023.07.001.

Asian American Enclaves and Healthcare Accessibility: An Ecologic Study Across Five States

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SUPPLEMENTAL MATERIAL

Supplemental materials associated with this article can be found in the online version at https://doi.org/10.1016/j.amepre.2023.07.001.

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Abstract

Introduction: Access to primary care has been a long-standing priority for improving population health. Asian Americans, who often settle in ethnic enclaves, have been found to underutilize health care. Understanding geographic primary care accessibility within Asian American enclaves can help to ensure the long-term health of this fast-growing population.

Methods: U.S. Census data from five states (California, Florida, New Jersey, New York, and Texas) were used to develop and describe census-tract level measures of Asian American enclaves and social and built environment characteristics for years 2000 and 2010. The 2-step floating catchment area method was applied to National Provider Identifier data to develop a tract-level measure of geographic primary care accessibility. Analyses were conducted in 2022–2023, and associations between enclaves (versus nonenclaves) and geographic primary care accessibility were evaluated using multivariable Poisson regression with robust variance estimation, adjusting for potential area-level confounders.

Results: Of 24,482 census tracts, 26.1% were classified as Asian American enclaves. Asian American enclaves were more likely to be metropolitan and have less poverty, lower crime, and lower proportions of uninsured individuals than nonenclaves. Asian American enclaves had higher primary care accessibility than nonenclaves (adjusted prevalence ratio=1.23, 95% CI=1.17, 1.29).

Conclusions: Asian American enclaves in five of the most diverse and populous states in the U.S. had fewer markers of disadvantage and greater geographic primary care accessibility. This study contributes to the growing body of research elucidating the constellation of social and built environment features within Asian American enclaves and provides evidence of health-promoting characteristics of these neighborhoods.

INTRODUCTION

Geographic primary care accessibility is often defined as the availability and proximity of primary care services within defined areas on the basis of travel time or distance, and is an important predictor of preventive care and better health.[1–5] Studies have shown that individuals with greater geographic access to primary care (e.g., cancer screenings, vaccinations) are more likely to receive preventive care and have improved health outcomes.[6,7] Furthermore, barriers to accessibility (e.g., having to travel ≥20 miles for mammograms) can discourage individuals from accessing health care, even services offered at no cost.[8] Therefore, improving geographic primary care accessibility can significantly impact population health. Geographic primary care accessibility is not uniformly distributed,[9] and has been found to be associated with factors such as socioeconomic disadvantage and neighborhood racial and ethnic composition.[10–14] There is limited research on healthcare accessibility among Asian Americans, despite the fact that this group tends to underutilize primary care services.[15,16] Although disease burden differs

between specific Asian American ethnic groups, there is evidence that Asian Americans experience high rates of diseases that could be prevented by primary care. For instance, the cost of preventable hospitalizations has been found to be higher among Japanese, Pacific Islander, and Native Hawaiian individuals than among White populations.[17] As another example, Chinese Americans have been found to have a higher prevalence of uncontrolled hypertension than White Americans.[18] Taken together, this points to a need to increase primary care services in these communities.

Asian Americans are likely to reside in *ethnic enclaves*,[19] which are defined as socially and economically distinct geographic areas where particular ethnic groups are spatially clustered.[20] However, it is important to note that there is variation in Asian American ethnic groups that tend to reside in enclaves owing to patterns of immigration, economic opportunities, and availability of cultural resources.[21] Residence in ethnic enclaves has been hypothesized to protect individuals by offering linguistic resources, economic opportunities, and cultural preservation,[22–25] although previous studies are mixed regarding the association between residence in enclaves and health.[26–28] Furthermore, there is mixed evidence on associations between ethnic enclaves and use of health care. Two studies have found that Asian Americans residing in neighborhoods with a higher density of ethnically concordant residents had higher healthcare utilization,[29,30] whereas another found that residence in ethnically dense neighborhoods was associated with lower preventive care utilization (e.g., colorectal cancer screening).[31] These mixed results may reflect insufficient consideration of geographic primary care accessibility in studies of Asian American enclaves. Contemporary approaches to measuring geographic primary care accessibility that account for geographic information on both the supply (e.g., primary care availability) and demand (e.g., patient population) of these services have, to the best of the authors' knowledge, yet to be applied in the literature about ethnic enclaves.

This study expands existing research using census tract (CT)-level data from 5 diverse states with substantial Asian American populations to describe the unique social and built environments of Asian American enclaves and evaluate the relationship between Asian American enclaves and healthcare accessibility.

METHODS

Study Population

Measures were defined for 2000 and 2010 CTs in California, Florida, New Jersey, New York, and Texas. CTs are small geographic regions with approximately 4,000 people and are used by the U.S. Census Bureau to report on local-level social and built environment attributes. Data for this study were taken from a parent grant that intended to examine disparities in both Asian American and Hispanic populations. These states are among the 10 states with the largest Asian American populations in 2010.[32] No IRB approval was required because data were publicly available.

Measures

The primary exposure was a dichotomous measure of Asian American enclave status, computed using data from the U.S. Census summary files and the 2008–2012 American Community Survey (ACS). Development of the Asian American enclaves measure has been described elsewhere.[33] In brief, separately for 2000 and 2010 CTs, principal components analysis was applied to 4 variables: percentage of (1) Asian American residents, (2) foreign-born Asian American residents, (3) Asian/Pacific Islander language speakers with limited English proficiency (i.e., residents who reported speaking English not well or not at all from a response scale ranging from not at all to very well), and (4) linguistically isolated households speaking an Asian/Pacific Islander language. Using the score of the first component, all CTs were categorized into quintiles pooled across all states. CTs were defined as *Asian American enclaves* if they comprised >250 Asian American residents and met either of the following criteria: (1) Quintile 5 (highest score) or (2) Quintile 4 and spatially adjacent to a Quintile 5 tract with >250 Asian American residents. All CTs not defined as Asian American enclaves were subsequently defined as *nonenclaves* (which could potentially represent enclaves of racial or ethnic groups other than Asian Americans). A variable describing Asian American enclave trajectories was also developed to describe changes in Asian American enclave status between the 2000 and 2010 decennial Census. Never enclaves were not classified as enclaves in either year, persistent enclaves were classified as enclaves in both years, emergent enclaves were classified as enclaves in 2010 but not 2000, and former enclaves were classified as enclaves in 2000 but not in 2010.

The primary outcome was a geographic indicator of primary care accessibility for the year 2010, which was computed using the 2-step floating catchment method. In brief, this is a well-accepted method of defining geographic accessibility and represents both the supply of primary care health providers and demand for services in an area.[34,35] The supply of providers was identified using data from the 2009 National Provider Identifier records. Primary care locations were geocoded using the provider's business practice location address. *Primary care providers* were defined as physicians, including doctors of Medicine and of osteopathic medicine specializing in family practice, general practice, internal medicine, geriatrics, obstetrics and gynecology, and public health or general preventive medicine. Mental health service providers were not included in this measure.

For each CT, the supply-to-demand ratio of primary care providers to the adult population (aged ≥18 years) was calculated on the basis of a 20-minute drive time from population-weighted CT centroid to the provider locations under optimal traffic conditions. Population estimates and population-weighted centroids were derived from the 2010 U.S. Census. Adult populations reachable within a 20-minute drive time from that provider, based on the centroid locations, were used to calculate provider-to-population ratio (supply-to-demand ratio for each individual provider). Then, for a given CT (at its centroid location), provider-to-population ratios for all providers reachable within a 20-minute drive time of that CT were summed. To identify areas with high healthcare accessibility, a measure of the observed accessibility values to the expected accessibility values (defined as a mean of the supply-to-demand ratio) was developed. This relative rather than absolute measure of healthcare accessibility was used because there is no consensus or gold-standard definition

of the optimal supply of healthcare providers. The final dichotomous outcome measure reflects the highest quartile of observed-to-expected values, representing high healthcare accessibility, compared with the lower 3 quartiles.

Neighborhood-level covariates (reflective of CTs overall) suspected to confound the relationship between enclave status and healthcare accessibility were selected. These data were taken from a variety of publicly available sources (e.g., U.S. Census, ACS, National Neighborhood Data Archive[36,37]) and included the proportion of crowded housing (defined by the U.S. Census Bureau as households with more people than rooms; thus, crowded households were defined as those with 1.5 or more persons per room), population density, percentage poverty (<100% Federal Poverty Level), park area per tract,[36,37] percentage of households with 1 or more vehicles, and uninsured residents. Additional covariates included an indicator of residential mobility defined on the basis of residence in a different house (since 1995 for 2000 data and in the past year for 2010 data); total crime index scores from the Environmental Systems Research Institute, which compare average local crime with crime at the national level;[38] 3 continuous variables representing the proportion of persons aged <35, 35–64, and 65 years or older were included to account for the underlying CT age structure; and finally, a binary indicator for metropolitan status was defined using Rural-Urban Commuting Area Codes (RUCA),[39] which classify rural–urban context using information on commuting patterns, population density, and urbanization.[40,41]

Statistical Analysis

First, descriptive statistics were used to characterize neighborhood social and built environment factors for enclaves and nonenclaves for both Census years (2000 and 2010). Next, multivariable Poisson models with robust variance estimators were used to estimate the adjusted prevalence ratio (PR) of high healthcare accessibility.[42,43] All suspected confounders statistically associated (p<0.10) with ethnic enclave and healthcare accessibility in bivariable analyses were included in multivariable models. Thus, the final models adjusted for percentage poverty, metropolitan communiting area, population density, residential mobility, proportion of uninsured individuals, crime, vehicle access, and CT age structure. All models included a state indicator variable to account for within-state differences in healthcare accessibility. Multicollinearity was evaluated using the variance inflation factor (VIF) test, and a cut off value of 5 was used to determine variables that should be excluded. In fully fitted models, VIF values ranged from 1.13 to 3.74, indicating that multicollinearity between variables was not a concern. For all models, marginal effects at the means (MEM) were also estimated to quantify absolute differences in the probability of high healthcare accessibility between enclaves and nonenclaves for the average CT (i.e., at the average value of all covariates).

RESULTS

In 2000, 23.7% (of 21,448 CTs) were classified as Asian American enclaves. In 2010, 26.1% (of 24,509 CTs) were Asian American enclaves (69.9% never enclaves, 20.1% persistent enclaves, 6.1% emergent enclaves, and 3.9% former enclaves).

In terms of social and built environment characteristics, Asian American enclaves tended to have less poverty and more immigrants, metropolitan RUCA designations, crowded housing, higher population density, and higher proportions of younger residents than nonenclaves across both time periods (Table 1). For characteristics only evaluated in 2010, Asian American enclaves had lower crime index scores, fewer uninsured residents, and fewer households without vehicle access as well as greater park areas per CT than nonenclaves. In addition, across both time periods, a higher prevalence of Asian American residents was observed within Asian American enclaves, although there were differences by specific ethnic groups (Table 2). Asian Indian/Pakistani, Japanese, Sri Lankan, and Asian Americans with unknown specific ethnic group identities were less likely to reside in an Asian American enclave, whereas Chinese, Hmong, and Vietnamese were more likely.

Persistent, emergent, and former enclaves had higher proportions of immigrants, more crowded housing, greater population density, more younger individuals, higher park area per tract, higher crime, and lower percentage uninsured than never enclaves (for persistent and emergent enclave types only) (Table 3).

In bivariable analysis (Table 4), Asian American enclaves had a higher prevalence of high healthcare accessibility (PR=1.45, 95% CI=1.38, 1.53; MEM=10%, 95% CI=8%, 11%) than nonenclaves. After adjusting for confounders, this association was attenuated but remained positive (PR=1.23, 95% CI=1.17, 1.29; MEM=5%, 95% CI=3%, 6%). A higher prevalence of high healthcare accessibility was observed among persistent enclaves (PR=1.27, 95% CI=1.20, 1.34; MEM=5%, 95% CI=4%, 7%), emergent enclaves (PR=1.17, 95% CI=1.09, 1.27; MEM=4%, 95% CI=2%, 5%), and former enclaves (PR=1.13, 95% CI=1.02, 1.26; MEM=3%, 95% CI=1%, 5%) than among never enclaves. Similar patterns of association between enclaves and high healthcare accessibility were observed in all states except Texas (Appendix Table 3, available online).

DISCUSSION

Using cross-sectional, ecologic data from CTs across five states, this study found differences in the social and built environment characteristics between Asian American enclaves and nonenclaves and across enclave trajectories. In addition, Asian American enclaves were found to have a higher prevalence of high healthcare accessibility, with persistent, emergent, and former enclaves having an increased prevalence of high healthcare accessibility compared with never enclaves.

Findings on the more health-promoting social and built environment attributes of Asian American enclaves are largely consistent with those of other studies. For instance, one study found that a majority of Asian American neighborhoods in California were “structurally and socially resourceful places to live,” being categorized as areas with higher proportions of high SES individuals.[44] Another found a marked increase in the number of affluent, immigrant Asian neighborhoods from 1990 to 2000 in the U.S.,[45] although crude measures of income may be insufficient in describing the financial health of Asian American families because residence in multigenerational households and transmission of wealth abroad are common practices in these communities and can mask the actual amount of resources and

wealth in this population.[46–49] Furthermore, although Asian Americans overall were more likely to reside in enclaves than in nonenclaves, there were considerable differences in the composition of specific Asian American ethnic groups in enclaves (e.g., a higher proportion of Chinese, Korean, and Vietnamese individuals were found in Asian American enclaves than in nonenclaves). This is notable, considering that individuals of Asian descent are the most economically divided racial group in the U.S.[50] owing to differences in immigration history and U.S. immigration policy.[51] Therefore, there is a need for a focused assessment of the social and built environments of enclaves that consider additional nuanced dimensions of the Asian American experience.

Asian American enclaves had a higher prevalence of high healthcare accessibility than nonenclaves. These findings can be contextualized in several ways. First, in this study, 99.7% of CTs categorized as Asian American enclaves were in metropolitan commuting areas, which was unsurprising, given that Asian Americans made up only 1% of rural populations in 2010.[52] Healthcare accessibility has been found to differ significantly between urban and rural regions, where urban areas tend to have more healthcare resources, such as hospitals, clinics, and specialists.[53,54] Thus, it is challenging to disentangle the association between Asian American enclaves, urbanicity, and healthcare accessibility. Second, the ethnic enclave measure aggregated all Asian American ethnic groups. Research suggests that there is heterogeneous utilization of healthcare among the diverse Asian American populations.[15] For example, Carreon and Baumeister found that living in CTs with a higher percentage of Asian American residents increased the likelihood that some Asian American groups (e.g., Chinese immigrants) but not all (e.g., Vietnamese immigrants) received a routine checkup in the past year.[29] In addition, the distribution of Asian American ethnic groups varies throughout the country.[51] Therefore, it is possible that this aggregation may mask heterogeneity related to different Asian American ethnic groups as well as other important intersectional characteristics (e.g., nativity, recency of immigration). To allocate resources effectively, healthcare services and policies should recognize the specific Asian American ethnic group composition within enclaves, considering the diverse health outcomes and structural and social determinants of health experienced by different groups. Finally, in supplementary analyses, positive associations between Asian American enclaves and geographic primary care accessibility were observed in all states except Texas. It is possible that the lack of association in Texas may be because Texas has very low healthcare accessibility overall and the highest uninsurance rate in the nation.[55,56] Under this scenario, even if there were a concentration of primary care physicians within Asian American enclaves in Texas, the overall low accessibility may offset any potential benefits that enclaves in this state can offer regarding healthcare accessibility because data were pooled across all five states. It is also possible that Asian American enclaves in Texas are different from enclaves in other states regarding healthcare infrastructure or resources. Therefore, additional research is needed to better understand how the association between Asian American enclaves and geographic primary care accessibility differs across states and to identify unique factors that may impact access for each state.

Finally, a higher prevalence of high healthcare accessibility was observed among all other enclave trajectories (persistent, emergent, and former) than among never enclaves. This study examines a relatively underexplored area. To the authors' knowledge, only 1 recent

study has evaluated the associations between trajectories of geographic access to healthcare facilities and neighborhood demographic characteristics,[14] which found no meaningful changes in geographic healthcare accessibility for CTs that remained predominantly Asian American from 2000 to 2014. There are several reasons for this discrepancy. First, Tsui et al. evaluated whether CTs were likely to gain (versus have the same number of) healthcare facilities between 2000 and 2014, whereas this study did not explore trajectories in healthcare accessibility (only in enclave status). Furthermore, whereas the former study presented results for defined trajectories (e.g., remained predominantly Asian American), this present analysis compares different trajectories of enclave status (i.e., persistent, emergent, and former enclaves versus never enclaves). Finally, whereas the former study defined neighborhoods with race and ethnicity data, this study defines Asian American enclaves using additional dimensions. These preliminary, ecologic findings present a promising direction for future studies using multilevel and longitudinal data to identify specific pathways through which enclave trajectories could influence health. For example, although the measure of geographic primary care accessibility does not capture components of language services provided by healthcare systems, it is possible that longer-standing enclaves have a higher number of linguistically and culturally relevant services. Future studies are needed to understand whether ethnic enclaves bolster the concentration of and accessibility to linguistically compatable healthcare providers.

Limitations

This study has several limitations. The use of ecologic data precludes the ability to make inferences about individuals living within enclaves. Although geographic primary care accessibility is an important and influential component of an individual's overall access, other factors, including the availability of culturally or linguistically appropriate services, are important factors for Asian American populations in the U.S. In addition, this study may be subject to measurement bias, which could have resulted in residual confounding. There are numerous approaches toward measuring domains of geographic access to health care,[57] and future studies should consider similar assessments using additional measures of geographic accessibility, including access to specialists or measures that are not subject to the modifiable areal unit problem. Furthermore, this study focused on geographic access to primary care physicians, whereas mental health providers, urgent care services, or emergency room facilities, which may be of high relevance to this community, were not included. However, although mental health services specifically have been found to be underutilized in Asian American communities,[58] research on Chinese Americans has found primary care settings to be feasible and less stigmatizing environments for discussing mental illness.[59] Finally, because data for this study were part of a parent grant that sought to investigate outcomes in both Asian American and Hispanic populations, the selection of states includes one (specifically, Florida) that does not have a large Asian American population. This study also does not include the most recent Census 2020 and ACS data, and demographic composition and access to healthcare may have shifted over time. For example, the landscape of medical practice has changed over the course of the COVID-19 pandemic (e.g., switch to telemedicine). However, a systematic review of Asian American healthcare behaviors during the pandemic found that this population had lower telemedicine adoption levels than other racial and ethnic groups.[60] This suggests that geographic primary

care accessibility remains an important factor related to primary care utilization for this population.

CONCLUSIONS

This study makes several contributions to the existing literature through two principal findings. Using CT-level data across five states comprising most Asian Americans in the U.S.,[32] findings demonstrate that there are unique social and built environment characteristics of Asian American enclaves. Furthermore, results suggest that Asian American enclaves had higher geographic primary care accessibility than nonenclaves. Given that Asian Americans are one of the fastest-growing populations in the U.S., additional research will be needed to identify points of intervention for healthcare policy and health promotion.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEDGMENTS

The research presented in this paper is that of the authors and does not reflect the official policy of the NIH.

This work was supported by several grants from the National Cancer Institute (R01CA237540) (multiple principal investigators: SSM [contact principal investigator] and SLP), Ethnicity and Nativity in Cancer – Latino & Asian Enclaves: The ENCLAVE study (R01CA230440 [principal investigator: CHK] and F31CA257351 [principal investigator: AG]), and Cancer Prevention Research Institute of Texas training Grant RP210041 (to ABR [contact principal investigator] and Melanie Cobb).

SLP reports consulting for Pfizer, unrelated to this work. The authors have no additional relationships to disclose. No financial disclosures were reported by the authors of this paper.

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Table 1.

Neighborhood Characteristics by Enclave Status for 2000 and 2010 Tracts (CA, FL, NJ, NY, and TX)

Variables	2000				2010			
	Total N=21,448 Mean (SD or %)	**Nonenclaves *n*=16,366 Mean (SD or %)**	**Asian American enclave *n*=5,082 Mean (SD or %)**	***p*-value**	**Total N=24,482 Mean (SD or %)**	**Nonenclaves *n*=18,087 Mean (SD or %)**	**Asian American enclave *n*=6,395 Mean (SD or %)**	***p*-value**
Percentage recent immigrant	19.2 (12.9)	18.8 (13.4)	20.4 (11.3)	**<0.01**	28.5 (17.2)	28.2 (17.9)	29.4 (15.1)	**<0.01**
Percentage poverty	14.3 (12.0)	14.8 (12.4)	12.6 (10.8)	**<0.01**	15.9 (12.5)	16.8 (12.9)	13.2 (11.1)	**<0.01**
Metropolitan commuting area	89.4	86.2	99.5	**<0.01**	91.5	88.6	99.7	**<0.01**
Percentage crowded housing	11.0 (12.7)	9.7 (12.0)	15.0 (13.7)	**<0.01**	6.0 (8.0)	5.6 (7.9)	7.4 (8.2)	**<0.01**
Population density per square mile (per 1,000 people)	9.8 (18.8)	7.9 (16.7)	15.9 (23.1)	**<0.01**	9.5 (17.9)	7.7 (16.1)	14.6 (21.2)	**<0.01**
Residential mobility	46.3 (13.4)	45.6 (13.2)	48.4 (13.5)	**<0.01**	15.1 (9.7)	15.1 (9.8)	15.0 (9.6)	0.69
Proportion aged <35 years	24.0 (9.7)	23.2 (9.3)	26.7 (10.5)	**<0.01**	23.6 (10.0)	22.9 (9.6)	25.7 (10.8)	**<0.01**
Proportion aged 35–64 years	37.6 (7.0)	37.6 (7.0)	37.8 (6.9)	0.07	39.4 (6.8)	39.2 (6.8)	39.9 (6.5)	**<0.01**
Proportion aged ≥65 years	12.8 (8.5)	13.5 (9.2)	10.7 (5.5)	**<0.01**	13.5 (8.9)	14.2 (9.6)	11.5 (5.8)	**<0.01**
Proportion of park area per tract	—	—	—		4.7 (10.9)	4.6 (11.3)	4.9 (9.8)	**0.03**
Percentage uninsured	—	—	—		17.7 (11.1)	18.3 (11.4)	15.8 (9.9)	**<0.01**
Total crime index	—	—	—		107.0 (101.0)	110.2 (107.2)	97.9 (80.3)	**<0.01**
Percentage vehicle access	—	—	—		92.6 (14.4)	93.2 (13.4)	90.9 (16.8)	**<0.01**
Enclave trajectory								**<0.01**
Never enclave	—	—	—		69.9	94.7	—	
Persistent enclave	—	—	—		20.1	—	76.7	
Emergent enclave	—	—	—		6.1	—	23.3	

Variables	2000				2010			
	Total N=21,448 Mean (SD or %)	**Nonenclaves *n*=16,366 Mean (SD or %)**	**Asian American enclave *n*=5,082 Mean (SD or %)**	***p*-value**	**Total N=24,482 Mean (SD or %)**	**Nonenclaves *n*=18,087 Mean (SD or %)**	**Asian American enclave *n*=6,395 Mean (SD or %)**	***p*-value**
Former enclave	—	—	—		3.9	5.3	—	

Note: Boldface indicates statistical significance ($p<0.05$).

p-values in the table were generated using chi-square test (for binary variables) and *t*-test (to compare means for continuous variables). Metropolitan commuting area was computed using data on RUCA classification for each census tract. Census tracts were classified as metropolitan for RUCA values <4, in accordance with classification codes published by the USDA Economic Research Service. Residential mobility for 2000 was assessed on the basis of residence in a different house in 1995, whereas mobility for 2010 was assessed on the basis of residence in a different house in the past year. Total crime index data were from the ESRI, which standardizes local crime levels against national levels. *Asian American enclaves* were defined using data from all 5 states combined.

CA, California; ESRI, Environmental Systems Research Institute; FL, Florida; NJ, New Jersey; NY, New York; RUCA, Rural-Urban Commuting Area; TX, Texas; USDA, U. S. Department of Agriculture.

Table 2.

Neighborhood Racial and Ethnic Composition by Enclave Status (CA, FL, NJ, NY, and TX), 2000 and 2010

Variables	2000				2010			
	Total N=21,448	**Nonenclave *n*=16,366**	**Asian American enclave *n*=5,082**	***p*-value**	**Total N=24,482**	**Nonenclave *n*=18,087**	**Asian American enclave *n*=6,395**	***p*-value**
Non–Asian American group, mean (SD)								
Hispanic	23.25 (24.73)	22.82 (25.90)	24.64 (20.47)	<0.01	28.36 (26.00)	28.60 (27.64)	27.70 (20.72)	**0.02**
AIAN	0.39 (1.68)	0.42 (1.92)	0.30 (0.29)	<0.01	0.36 (1.82)	0.40 (2.11)	0.25 (0.29)	**<0.01**
Black	11.95 (20.28)	13.48 (22.37)	7.04 (9.75)	<0.01	11.39 (18.31)	12.82 (20.41)	7.38 (9.30)	**<0.01**
NHPI	0.12 (0.36)	0.08 (0.27)	0.26 (0.54)	<0.01	0.14 (0.39)	0.09 (0.27)	0.28 (0.58)	**<0.01**
Biracial or multiracial	1.93 (1.75)	1.61 (1.57)	2.98 (1.88)	<0.01	1.87 (1.44)	1.60 (1.35)	2.61 (1.45)	**<0.01**
White	56.22 (31.49)	59.28 (32.73)	46.41 (24.72)	<0.01	50.33 (30.60)	53.66 (32.08)	41.03 (23.67)	**<0.01**
Asian American ethnic group, mean (SD)								
Any Asian American	5.90 (9.78)	2.12 (2.70)	18.00 (13.65)	<0.01	7.28 (11.50)	2.60 (3.07)	20.37 (15.60)	**<0.01**
Asian Indian/Pakistani	22.40 (21.49)	24.22 (22.32)	16.70 (17.48)	<0.01	22.96 (20.01)	24.27 (20.26)	19.35 (18.82)	**<0.01**
Bangladeshi	0.48 (2.97)	0.47 (3.17)	0.52 (2.23)	0.29	1.08 (4.30)	1.07 (4.34)	1.12 (4.18)	0.39
Cambodian	1.27 (5.47)	1.18 (5.21)	1.55 (6.20)	<0.01	1.69 (5.82)	1.72 (5.85)	1.61 (5.74)	0.20
Chinese	20.05 (19.01)	17.92 (17.33)	26.73 (22.21)	<0.01	19.30 (17.56)	17.25 (15.44)	24.99 (21.39)	**<0.01**
Filipino	20.50 (19.85)	20.56 (19.69)	20.34 (20.34)	0.50	21.88 (19.45)	22.37 (19.23)	20.53 (19.97)	**<0.01**
Hmong	0.70 (5.25)	0.44 (3.86)	1.53 (8.14)	<0.01	0.85 (5.54)	0.64 (4.52)	1.41 (7.66)	**<0.01**
Indonesian	0.46 (2.16)	0.46 (2.40)	0.44 (1.07)	0.51	0.52 (2.00)	0.54 (2.24)	0.48 (1.05)	**0.04**
Japanese	8.04 (11.70)	8.38 (12.44)	6.96 (8.90)	<0.01	5.64 (8.35)	5.94 (8.90)	4.84 (6.51)	**<0.01**
Korean	10.01 (12.98)	9.92 (12.90)	10.29 (13.22)	0.08	8.70 (11.31)	8.29 (10.54)	9.81 (13.13)	**<0.01**

Variables	2000				2010			
	Total N=21,448	**Nonenclave *n*=16,366**	**Asian American enclave *n*=5,082**	***p*-value**	**Total N=24,482**	**Nonenclave *n*=18,087**	**Asian American enclave *n*=6,395**	***p*-value**
Laotian	1.46 (6.37)	1.46 (6.51)	1.47 (5.88)	0.85	1.43 (5.47)	1.54 (5.91)	1.13 (4.01)	**<0.01**
Malaysian	0.09 (0.61)	0.09 (0.69)	0.08 (0.27)	0.14	0.11 (0.79)	0.11 (0.90)	0.09 (0.26)	0.08
Other Asian American	0.24 (1.59)	0.25 (1.80)	0.21 (0.51)	0.18	0.13 (1.08)	0.14 (1.22)	0.11 (0.48)	**0.03**
Sri Lankan	0.26 (1.74)	0.28 (1.97)	0.21 (0.65)	0.03	0.33 (1.68)	0.35 (1.89)	0.30 (0.87)	**0.04**
Thai	1.76 (5.25)	2.00 (5.93)	0.99 (1.69)	<0.01	1.94 (4.63)	2.24 (5.23)	1.10 (2.05)	**<0.01**
Vietnamese	9.91 (15.87)	9.57 (15.70)	10.97 (16.35)	<0.01	10.04 (14.66)	9.66 (14.00)	11.07 (16.31)	**<0.01**
Enclave trajectory (column %)								**<0.01**
Never	—	—	—		69.9%	94.7%	0.0%	
Always	—	—	—		20.1%	0.0%	76.7%	
Emergent	—	—	—		6.1%	0.0%	23.3%	
Former	—	—	—		3.9%	5.3%	0.0%	

Note: Boldface indicates statistical significance ($p<0.05$).

p-values in the table were computed from chi-square or *t*-tests.

AIAN, American Indian or Alaskan Native; CA, California; FL, Florida; NHPI, Native Hawaiian or Pacific Islander; NJ, New Jersey; NY, New York; TX, Texas.

Table 3.

Neighborhood Characteristics by Enclave Trajectory for 2010 Census Tracts (CA, FL, NJ, NY, and TX)

Variables	Total N=24,390 Median (IQR)	Asian American enclave trajectory				
		Never *n*=17,046 Median (IQR)	Persistent *n*=4,902 Median (IQR)	Emergent *n*=1,493 Median (IQR)	Former *n*=949 Median (IQR)	*p*-value
Percent recent immigrant	26.8 (16.3–38.7)	26.5 (15.0–38.9)	27.0 (18.6–37.1)	28.8 (19.1–41.5)	27.8 (17.9–40.4)	**<0.01**
Percent poverty	12.5 (6.36–22.2)	13.5 (7.97–23.6)	10.2 (5.39–18.2)	9.18 (4.74–16.9)	13.8 (6.42–24.5)	**<0.01**
Metropolitan commuting area (%)	91.6	88.2	99.8	99.5	99.0	**<0.01**
Percent crowded housing	3.1 (0.9–8.0)	2.6 (0.6–6.9)	5.2 (1.9–11.5)	2.8 (0.9–6.3)	4.7 (1.4–12.0)	**<0.01**
Population density per square mile (per 1,000 people)	4.0 (1.3–8.8)	3.0 (0.7–6.5)	8.4 (4.7–15.9)	4.7 (2.3–9.0)	6.7 (3.5–11.3)	**<0.01**
Residential mobility	13.1 (8.5–19.2)	13.0 (8.5–19.0)	12.5 (8.3–18.4)	14.3 (9.1–21.3)	14.9 (9.2–22.6)	**<0.01**
Proportion aged <35 years	22.8 (18.0–26.9)	22.0 (17.4–26.1)	24.6 (20.3–28.5)	23.9 (19.1–28.9)	26.0 (21.1–30.5)	**<0.01**
Proportion aged 35–64 years	40.0 (35.6–43.9)	39.8 (35.3–43.8)	40.8 (37.0–44.0)	40.1 (36.0–43.9)	38.1 (33.7–43.1)	**<0.01**
Proportion aged ≥65 years	12.0 (8.2–16.3)	12.6 (8.7–17.1)	11.0 (7.9–14.7)	9.9 (6.3–14.3)	9.6 (6.5–13.9)	**<0.01**
Proportion of park area per tract	0.9 (0.0–3.9)	0.7 (0.0–3.5)	1.4 (0.0–4.5)	1.5 (0.0–5.5)	1.0 (0.0–4.3)	**<0.01**
Percentage uninsured	15.8 (9.0–24.2)	16.5 (9.4–25.2)	14.3 (8.4–22.0)	12.8 (7.6–19.8)	17.7 (9.1–26.7)	**<0.01**
Total crime index	79.0 (38.0–144.0)	78.0 (38.0–148.0)	80.0 (38.0–134.0)	81.0 (38.0–142.0)	86.0 (43.0–152.0)	**<0.01**
Percentage vehicle access	97.8 (93.9–99.3)	97.9 (94.3–99.4)	97.5 (92.3–99.1)	98.2 (94.0–99.4)	97.4 (92.8–99.3)	**<0.01**

Note: Boldface indicates statistical significance ($p<0.01$).

p-values in the table were generated using chi-square test (for binary metropolitan status variable) and the Kruskal–Wallis *H* test (to compare medians for continuous variables). Metropolitan commuting area was computed using data on RUCA classification for each census tract. Census tracts were classified as metropolitan for RUCA values <4, in accordance with classification codes published by the USDA Economic Research Service. Residential mobility was assessed on the basis of residence in different houses in the past year. Total crime index data were from the ESRI, which standardizes local crime levels against national levels. Enclave trajectory was derived on the basis of Asian American enclave classifications in the years 2000 and 2010. Never enclaves were not classified as enclaves in either year, persistent enclaves were classified as enclaves in both years, emergent enclaves were classified as enclaves in 2010 but not in 2000, and former enclaves were classified as enclaves in 2000 but not in 2010.

CA, California; ESRI, Environmental Systems Research Institute; FL, Florida; NJ, New Jersey; NY, New York; RUCA, Rural-Urban Commuting Area; TX, Texas; USDA, U. S. Department of Agriculture.

Table 4.

Association Between Asian American Enclaves and Geographic Healthcare Accessibility (CA, FL, NJ, NY, and TX), 2010

Model	Prevalence ratio (95% CI)	Marginal effects at the means (95% CI)
Asian American enclave (bivariable)	**1.45 (1.38, 1.53)** **	**0.10 (0.08, 0.11)** **
Asian American enclave (multivariable)	**1.23 (1.17, 1.29)** **	**0.05 (0.03, 0.06)** **
Multivariable by enclave trajectory		
Never enclave	1.00 (ref)	
Persistent enclave	**1.27 (1.20, 1.34)** **	**0.05 (0.04, 0.07)** **
Emergent enclave	**1.17 (1.09, 1.27)** **	**0.04 (0.02, 0.05)** **
Former enclave	**1.13 (1.02, 1.26)** *	**0.03 (0.01, 0.05)** *

Note: Boldface indicates statistical significance

* $p<0.05$ and

** $p<0.01$.

Poisson regression models with robust variance estimation were used to estimate prevalence ratios. Models included an indicator for state to account for within-state differences in healthcare accessibility, and the reference was nonenclave census tracts. Multivariable models adjusted for percentage poverty, metropolitan RUCA classification, population density, residential mobility, the proportion of uninsured individuals, crime, vehicle access, and the underlying age structure. Enclave trajectory was derived on the basis of Asian American enclave classifications in the years 2000 and 2010. Never enclaves were not classified as enclaves in either year, persistent enclaves were classified as enclaves in both years, emergent enclaves were classified as enclaves in 2010 but not in 2000, and former enclaves were classified as enclaves in 2000 but not in 2010.

CA, California; FL, Florida; NJ, New Jersey; NY, New York; RUCA, Rural-Urban Commuting Area; TX, Texas.